What is claimed is:

1. A method of sorting objects comprising:

introducing the objects into an input channel at a predetermined flow rate;

funneling the objects using a beam steering apparatus;

evaluating the objects to determine which meet a predetermined criteria; and

sorting the objects which meet said criteria from objects which do not meet said criteria.

2. The method according to claim 1, further comprising:

introducing a buffer solution into output channels disposed in parallel to said input channel at a flow rate the same as in said input channel, such that parallel lines of laminar flow are formed.

3. The method according to claim 2, wherein the sorting step further comprises:

transferring the objects which meet said criteria from said input channel to one of said output channels.

4. The method according to claim 3, wherein there is no mechanical separation between said input channel and said output channels when the sorting step is performed.

5. The method according to claim 2, further comprising:

maintaining a minimum distance between the objects in said lines of laminar flow using said beam steering apparatus of the funneling step.

6. The method according to claim 5, wherein said flow rates in said input channel and said output channels are set by said minimum distance, by an update rate in the performance of the sorting step, and by an overall object processing rate.

7. The method according to claim 1, wherein the objects are sperm, and the sorting step sorts X-chromosome bearing sperm from Y-chromosome bearing sperm.

8. The method according to claim 3, wherein said beam steering apparatus is an optical trapping apparatus which forms optical traps, and said optical traps are composed of a pattern of low intensity traps established by a set of static holograms mounted in a rotating wheel.

9. The method according to claim 8, wherein said pattern of optical traps changes as a function of said rotation pattern.

10. The method according to claim 9, wherein said optical traps in said funneling step which are located in a downstream region are of fixed intensity and position and maintain a separation between said lines of laminar flow of the objects.

11. The method according to claim 10, wherein said optical traps in said funneling step which are located an upstream region change both intensity and position with time to act in order to disturb a laminar flow of clumped objects and pass through a laminar flow of individual objects.

12. The method according to claim 10, wherein said sorting step occurs at an earliest point in said downstream region.

13. The method according to claim 3, wherein said criteria for sorting includes scattering measurements and optical deflection.

14. The method according to claim 3, wherein a width of a field-of-view of an objective lens used to implement said beam steering apparatus in said sorting step is the same as a width of a field-of-view of said input channel and said output channels.

15. The method according to claim 6, wherein a length of said input channel and a length of said output channels depends on said flow rates, a depth of said channels, and said update rate of each of said channels.

16. The method according to claim 15, wherein spatial light modulators that create phase masks are used to drive said beam steering apparatus, and an update rate of at least one of said spatial light modulators is at least 30 Hz.

17. The method according to claim 14, wherein said objective lens has a relatively low numerical aperture.

18. The method according to claim 17, wherein a radius of a cone of a light beam from said beam steering apparatus, is directly determined by said numerical aperture.

19. The method according to claim 18, wherein multiple light beams are used.

20. A method of sorting objects comprising:

distributing the objects over a surface of a structure; and

evaluating the objects in said structure according to a predetermined criteria using a beam steering apparatus.

21. The method according to claim 20, wherein said structure is a disc.

22. The method according to claim 21, further comprising:

combining rotational motion of said disc with radial motion of a laser to access the objects.

23. The method according to claim 22, further comprising:

ensuring the objects maintain their relative positions on said disc.

24. The method according to claim 23, wherein said ensuring step comprises: providing each of the objects in a fluid chamber.

25. The method according to claim 23, wherein said ensuring step comprises: immobilizing the objects in a gel.

26. The method according to claim 23, wherein said ensuring step comprises: providing an adhering surface to bind the objects.

27. The method according to claim 23, wherein said ensuring step comprises: encompassing the objects in a gel.

28. The method according to claim 23, further comprising: measuring the objects to ascertain their relative positions.

29. The method according to claim 20, wherein said beam steering apparatus is an optical trapping apparatus.

30. The method according to claim 20, wherein said structure is a substrate, and said substrate is heated to melt a surface of said substrate, and the objects are embedded in said surface of said substrate.

31. The method according to claim 30, wherein the objects are released from said surface of said substrate when said substrate is reheated.

32. The method according to claim 30, wherein said predetermined criteria is a predetermined absorption spectra.

33. A method of sorting objects comprising:

distributing the objects in a gel;

detecting the objects which meet a predetermined criteria; and

sorting the objects which meet said criteria from objects which do not meet said criteria.

34. The method according to claim 33, wherein the sorting step is accomplished using a beam steering apparatus.

35. The method according to claim 34, wherein heat from lasers used in said beam steering apparatus is used to melt said gel and provide exit pathways for the desired objects.

36. The method according to claim 33, wherein the objects which do not meet said criteria are killed.

37. The method according to claim 33, wherein heat is applied to melt said gel and the objects which meet said criteria are separated from the objects which do not meet said criteria.

38. The method according to claim 33, wherein a thermal explosion is generated to disintegrate the objects which do not meet said criteria into remnants, such that the sorting step may be accomplished on said remnants based on size.

39. The method according to claim 23, wherein the objects which do not meet said criteria are killed.

40. An apparatus for sorting objects comprising:

a plurality of optical traps formed using an optical trapping apparatus;

an input channel into which the objects are introduced at a predetermined flow rate; and

at least one output channel;

wherein the objects are sorted according to predetermined criteria using said optical traps in a sorting region prior to entering said output channel.

41. The apparatus according to claim 40, wherein said input channel is parallel to said at least one output channel.

42. The apparatus according to claim 41, wherein said input channel and said at least one output channel have a same width.

43. The apparatus according to claim 40, wherein a buffer solution is introduced into said at least one out put channel at a same flow rate as maintained in said input channel.

44. The apparatus according to claim 40, wherein in said sorting region, no mechanical separation exists between a flow in said input channel and a flow in said at least one output channel.

45. The apparatus according to claim 40, wherein said optical traps funnel the objects in said input channel such that the objects travel in well-defined lines of flow and are separated from each another by a minimum distance.

46. The apparatus according to claim 45, wherein said flow rates in said input channel and said at least one output channel are set by said minimum distance, by an update rate in the performance of the sorting step, and by an overall object processing rate.

47. The apparatus according to claim 40, wherein the objects are sperm, and X-chromosome bearing sperm are sorted from Y-chromosome bearing sperm in said sorting region.

48. The apparatus according to claim 45, wherein said optical traps which perform said funneling are composed of a pattern of low intensity traps established by a set of static holograms mounted in a rotating wheel.

49. The apparatus according to claim 48, wherein said pattern of optical traps changes as a function of said rotation pattern.

50. The apparatus according to claim 49, wherein said optical traps which perform said funneling in a downstream region are of fixed intensity and position and maintain a separation between said lines of flow of the objects.

51. The apparatus according to claim 50, wherein said optical traps which perform said funneling in an upstream region change both intensity and position with time to act in order to disturb a flow of clumped objects and pass through a flow of individual objects.

52. The apparatus according to claim 51, wherein said sorting region is disposed at an uppermost point in said downstream region.

53. The apparatus according to claim 40, wherein said criteria for sorting includes scattering measurements and optical deflection.

54. The apparatus according to claim 40, wherein a width of a field-of-view of an objective lens used to implement said optical traps in said sorting region is the same as a width of a field-of-view of said input channel and said at least one output channel.

55. The apparatus according to claim 54, wherein a length of said input channel and a length of said at least one output channel depends on said flow rates, a depth of said channels, and said update rate of each of said channels.

56. The apparatus according to claim 55, wherein spatial light modulators that create phase masks are used to drive said optical traps, and an update rate of at least one of said spatial light modulators is at least 30 Hz.

57. The apparatus according to claim 54, wherein said objective lens has a relatively low numerical aperture.

58. The apparatus according to claim 57, wherein a radius of a cone of a light beam used on said optical traps, is directly determined by said numerical aperture.

59. The apparatus according to claim 58, wherein multiple light beams are used.

60. An apparatus for sorting objects comprising:

a beam steering apparatus; and

a structure having a surface on which the objects are distributed;

wherein the objects are sorted using said bean steering apparatus, according to whether the objects meet predetermined criteria.

61. The apparatus according to claim 60, wherein said structure is a disc.

62. The apparatus according to claim 61, wherein a rotational motion of said disc is combined with a radial motion of a laser from said beam steering apparatus, to access the objects.

63. The apparatus according to claim 60, wherein the objects maintain their relative positions on said disc.

64. The apparatus according to claim 63, wherein said relative positions are maintained by one of providing each of the objects in a fluid chamber, immobilizing the objects in a gel, and providing an adhering surface to bind the objects.

65. The apparatus according to claim 64, wherein the objects are measured to ascertain their relative positions.

66. The apparatus according to claim 60, wherein said structure is a substrate, and said substrate is heated to melt a surface of said substrate, and the objects are embedded in said surface of said substrate.

67. The apparatus according to claim 66, wherein the objects are released from said surface of said substrate when said substrate is reheated.

68. The apparatus according to claim 60, wherein said predetermined criteria is a predetermined absorption spectra.

69. An apparatus for sorting objects comprising:

means for introducing the objects into an input channel at a predetermined flow rate;

means for funneling the objects;

means for evaluating the objects to determine which objects meet predetermined criteria; and

means for sorting the objects which meet said criteria from objects which do not meet said criteria.

70. An apparatus for sorting objects comprising:

means for distributing the objects over a surface of a structure; and

means for evaluating the objects in said structure according to predetermined criteria using a beam steering apparatus.

71. An apparatus for sorting objects comprising:

means for distributing the objects in a gel;

means for detecting the objects which meet a predetermined criteria; and

means for sorting the objects which meet said criteria from objects which do not meet said criteria.

72. A method of sorting objects comprising:

accessing an object using an optical trap;

examining said object to determine its identity; and

sorting said identified object according to predetermined criteria.

73. The method according to claim 72, wherein said optical trap is generated by:

directing a laser beam from a laser to a diffractive optical element which diffracts said beam into a plurality of beamlets; and

converging the beamlet through the objective lens, thereby producing optical gradient conditions resulting in an optical data stream to form said optical trap.

74. The method according to claim 72, further comprising:

identifying the objects by performing a spectroscopy of the objects.

75. The method according to claim 74, wherein said spectroscopy is performed by illuminating the objects using an imaging illumination source.

76. The method according to claim 75, wherein a chemical identity of the object is assessed.

77. The method according to claim 76, wherein a measurement of an internal structure of the object is performed.

78. The method according to claim 76, wherein said object which meets said predetermined criteria is contained by said optical trap.

79. The method according to claim 78, further comprising:

identifying said object based on one of a reaction and binding of said contained object with predetermined chemicals.

80. The method according to claim 72, wherein at least one of a movement and contents of each optical trap is monitored.

81. The method according to claim 80, wherein said monitoring is performed using one of a video camera, a spectrum, and said optical data stream.

82. The method according to claim 72, wherein a movement of said object is tracked based on a predetermined movement of each optical trap caused by encoding said optical element.

83. The method according to claim 81, further comprising:

maintaining a record of each object contained in each optical trap.

84. The method according to claim 83, wherein said optical data stream is processed to monitor its intensity.

85. The method according to claim 71, wherein said object is transferred from one optical trap to a second optical trap.

86. The method according to claim 84, wherein said object is transferred by using a static phase patterning optical element rotated around a spindle to align said laser beam with another region which generates a second set of optical traps at a corresponding set of predetermined positions proximate to said one optical trap.

87. The method according to claim 86, wherein an arrangement of said optical traps is staggered.

88. The method according to claim 79, wherein when said object meets said criteria, said object is labeled.

89. The method according to claim 85, wherein said object is transferred by optical peristalsis.

90. The method according to claim 71, further comprising:

forming a focusing pattern of the objects by at least one of reducing a spacing between said optical traps in lines toward a predetermined direction and reducing a curvature of said lines of said optical traps.

91. The method according to claim 90, further comprising:

dispersing a focusing pattern of the objects by at least one of increasing a spacing between said optical traps in lines toward a predetermined direction and increasing a curvature of said lines of said optical traps.

92. The method according to claim 90, further comprising:

increasing movement of the objects by increasing said spacing between said lines of said optical traps.

93. The method according to claim 91, further comprising:

decreasing movement of the objects by decreasing said spacing between said lines of said optical traps.

94. The method according to claim 71, further comprising:

wherein an intensity of selected optical traps and lines of said optical traps is varied.

95. The method according to claim 89, wherein said optical peristalsis is combined with differential effects of one of viscous drag and electric fields.

96. The method according to claim 89, wherein said optical peristalsis is implemented with a holographic system which cycles through a sequence of phase patterns to implement a corresponding sequence of holographic optical trapping patterns.

97. The method according to claim 96, wherein said patterns are encoded on a surface of said optical element which is rotated to cycle through each pattern.

98. The method according to claim 97, wherein switchable phase gratings and phase holograms encoded on film are used.

99. The method according to claim 71, further comprising:

increasing a bias force such that objects flow past a rectilinear array rather than being trapped by said optical traps.

100. The method according to claim 99, wherein said bias force can differ causing said object to move from optical trap to optical trap along a direction of a principal axis of said array.

101. The method according to claim 72, wherein a height of said trap can be changed.

102. The method according to claim 101, wherein said height change is performed by adjusting said hologram such that said light beam forming said optical trap one of converges and diverges as it enters said objective lens.

103. The method according to claim 102, wherein an adjustment of phase modulation caused by said hologram adjusts said height of said one optical trap to change independently of another optical trap.

104. An apparatus for sorting objects comprising:

means for accessing an object using an optical trap;

means for examining said object to determine its identity; and

means for sorting said identified object according to predetermined criteria.

105. An apparatus for sorting objects comprising:

a beam steering apparatus including:

a laser which provides a laser beam for illumination;

a diffractive optical element which diffracts said beam into a plurality of beamlets; and

an objective lens which converges the beamlet, thereby producing optical gradient conditions resulting in an optical data stream to form an optical trap; and

a sample chamber into which the objects are introduced, trapped and sorted.

106. The apparatus according to claim 105, wherein the objects are moved by holding them with said optical trap and moving a stage of the microscope vertically or laterally.

107. The apparatus according to claim 106, wherein said optical element has one of a static and a dynamic surface.

108. The apparatus according to claim 107, wherein said optical elemnt is a liquid crystal array controlled by an electrostatic field.

109. The apparatus according to claim 108, wherein said liquid crystal of said liquid crystal array is a nematic liquid crystal.

110. The apparatus according to claim 105, wherein said optical element includes at least one fixed surface region.

111. The apparatus according to claim 105, wherein said optical element includes gratings, holograms, lenses, mirrors, prisms, and waveplates.

112. The apparatus according to claim 105, wherein said optical element has a time dependent function.

113. The apparatus according to claim 105, wherein said objective lens has a relatively low numerical aperture.

114. The apparatus according to claim 105, further comprising an imaging system.

115. The apparatus according to claim 114, wherein said imaging system is a camera.

116. The apparatus according to claim 114, further comprising:

a display.

117. The apparatus according to claim 105, wherein a power level of said optical trap is monitored.

118. The apparatus according to claim 105, wherein said optical trap is a holographic optical trap.

119. The apparatus according to claim 118, wherein a height of said optical trap can be changed.

120. The apparatus according to claim 119, wherein said height change is performed by adjusting said hologram such that said light beam forming said optical trap one of converges and diverges as it enters said objective lens.

121. The apparatus according to claim 120, wherein an adjustment of phase modulation caused by said hologram adjusts said height of said one optical trap to change independently of another optical trap.

122. The apparatus according to claim 105, wherein said sample chamber comprises:

a plurality of channels for introducing the objects.

123. The apparatus according to claim 122, wherein said channels are connected to tubing by syringe needles, the tubing which lead to supply and collection reservoirs.

124. The apparatus according to claim 123, wherein the objects are suspended in a liquid medium.

125. The apparatus according to claim 123, wherein micropumps introduce said liquid medium with suspended objects into said channels of said sample chamber.

126. The apparatus according to claim 122, wherein said channels are 50 microns wide and 50 microns deep.

127. The apparatus according to claim 105, wherein said sample chamber is made of a PDMS resin.

128. The apparatus according to claim 118, wherein said holographic optical trap manipulates said object by distributing relatively smaller amounts of force continuously among a number of points on said object.

129. The apparatus according to claim 105, wherein said object is identified according to predetermined criteria prior to sorting.

130. The apparatus according to claim 129, wherein said object is identified using spectroscopy.

131. The apparatus according to claim 130, wherein said spectroscopy is performed by illuminating said object using an imaging illumination source.

132. The apparatus according to claim 131, wherein a chemical identity of the object is assessed.

133. The apparatus according to claim 131, wherein a measurement of an internal structure of the object is performed.

134. The apparatus according to claim 129, wherein said object which meets said predetermined criteria is contained by said optical trap.

135. The apparatus according to claim 134, wherein said object is identified based on one of a reaction and binding of said contained object with predetermined chemicals.

136. The apparatus according to claim 105, wherein at least one of a movement and contents of each optical trap is monitored.

137. The apparatus according to claim 136, wherein said monitoring is performed using one of a video camera, a spectrum, and said optical data stream.

138. The apparatus according to claim 136, wherein said movement of said object is tracked based on a predetermined movement of each optical trap caused by encoding said optical element.

139. The apparatus according to claim 136, wherein a record of each object contained in each optical trap is maintained.

140. The apparatus according to claim 105, wherein said optical data stream is processed to monitor its intensity.

141. The apparatus according to claim 105, wherein said object is transferred from one optical trap to a second optical trap.

142. The apparatus according to claim 141, wherein said object is transferred by using a static phase patterning optical element rotated around a spindle to align said laser beam with another region which generates a second set of optical traps at a corresponding set of predetermined positions proximate to said one optical trap.

143. The apparatus according to claim 141, wherein an arrangement of said optical traps is staggered.

144. The apparatus according to claim 130, wherein when said object meets said criteria, said object is labeled.

145. The apparatus according to claim 141, wherein said object is transferred by optical peristalsis.

146. The apparatus according to claim 145, wherein a focusing pattern of the objects is formed by at least one of reducing a spacing between said optical traps in lines toward a predetermined direction and reducing a curvature of said lines of said optical traps.

147. The apparatus according to claim 146, wherein a focusing pattern of the objects is dispersed by at least one of increasing a spacing between said optical traps in lines toward a predetermined direction and increasing a curvature of said lines of said optical traps.

148. The apparatus according to claim 146, wherein movement of the objects is increased by increasing said spacing between said lines of said optical traps.

149. The apparatus according to claim 147, wherein movement of the objects is decreased by decreasing said spacing between said lines of said optical traps.

150. The apparatus according to claim 105, wherein an intensity of selected optical traps and lines of said optical traps is varied.

151. The apparatus according to claim 145, wherein said optical peristalsis is combined with differential effects of one of viscous drag and electric fields.

152. The apparatus according to claim 151, wherein said optical peristalsis is implemented with a holographic system which cycles through a sequence of phase patterns to implement a corresponding sequence of holographic optical trapping patterns.

153. The apparatus according to claim 152, wherein said patterns are encoded on a surface of said optical element which is rotated to cycle through each pattern.

154. The apparatus according to claim 153, wherein switchable phase gratings and phase holograms encoded on film are used.

155. The apparatus according to claim 105, wherein a bias force is increased such that objects flow past a rectilinear array rather than being trapped by said optical traps.

156. The apparatus according to claim 155, wherein said bias force can differ causing said object to move from optical trap to optical trap along a direction of a principal axis of said array.

157. The apparatus according to claim 105, wherein the objects are sperm, and X-chromosome bearing sperm are sorted from Y-chromosome bearing sperm.

158. The apparatus according to claim 129, wherein when the objects are sorted into objects that meet said predetermined criteria and objects that do not meet said predetermined criteria, the objects that do not meet said predetermined criteria are killed.

159. The apparatus according to claim 61, wherein the beam steering apparatus is an optical trapping apparatus.

160. The method according to claim 73, further comprising:

controlling each beamlet by altering a hologram encoded in a dynamic surface medium of the diffractive optical element.

161. The apparatus according to claim 105, further comprising:

a beam splitter which controls each beamlet by altering a hologram encoded in a dynamic surface medium of the diffractive optical element.

162. A method of manipulating objects comprising:

introducing the objects into an evaluation system;

evaluating the objects according to a predetermined criteria using a beam steering apparatus; and

manipulating the objects according to said predetermined criteria using said beam steering apparatus.

163. A method of destroying objects comprising:

accessing an object using a beam steering apparatus;

examining said object to determine its identity;

sorting said identified object according to predetermined criteria; and

destroying said identified object when said object meets said predetermined criteria.

164. An apparatus for destroying objects comprising:

means for accessing an object using a beam steering apparatus;

means for examining said object to determine its identity;

means for sorting said identified object according to predetermined criteria; and

means for destroying said identified object when said object meets said predetermined criteria.